

Amendment After Final
April 17, 2006

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Serial No.: 10/707,892

REMARKS

Claims 1 – 5, 7 – 14 and 21 – 25 remain in the application and stand finally rejected. Claims 6 and 15 – 20 are previously canceled. A proposed amendment to claims 1, 5, 8, 11, 12 and 21 is offered herein. No new matter is added by this amendment.

The drawings are objected to under 37 C.F.R. §1.83(a) for not showing every feature of the invention specified in the claims. Specifically it is asserted that the “copper seed layer, conducting layer and the nickel layer” as recited in claim 21 is not shown in the Figures. While, this is clearly described in the specification, as previously noted, the figures are mere representations of a physical structure and are not drawn to scale. Further, a layer can be represented, for example, as a line between two other layers. Thus, the applicants believe the claim 21 was supported by both the specification and the drawings. Be that as it may, however, claim 21 is amended herein to remove the recitation of a conducting layer. Entry of the amendment, reconsideration and withdrawal of the objection to the drawings to under 37 C.F.R. §1.83(a) is respectfully requested.

Claims 22 – 24 are rejected under 35 C.F.R. §112, first paragraph, for failing to comply with the written description requirement. Claims 22 – 24, which substantially parallel claims 2 – 4, are rejected, essentially, for depending from claim 21. Accordingly, the applicants believe that claims 22 – 24, as amended by the amendment to claim 21, comply with the written description requirement. Entry of the amendment, reconsideration and withdrawal of the rejection to claims 22 – 24 under 35 C.F.R. §112 is respectfully requested.

Although the final Office action alleges that the applicants' prior amendment necessitated new grounds for rejection, the applicants could not identify any substantive

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such new grounds, as the rejection of all claims is, as far as the applicants can tell, a copy of the previous rejection. (The final rejection of claims 21 – 25 is incorporated with the corresponding rejection of claims 1 – 5.) So, claims 1 – 5 and 7 are finally rejected under 35 U.S.C. §102(e) over U.S. Patent No. 6,798,050 to Homma et al. Claims 1, 5, 7, 21 and 25 are also finally rejected under 35 U.S.C. §103(a) over Tseng et al. U.S. Patent No. 6,696,356 in view of U.S. Patent No. 4,876,213 to McCormick. Claims 8 – 13 and 22 – 24 are finally rejected under 35 U.S.C. §103(a) over U.S. Patent No. 6,232,212 to Degani et al. in view of McCormick. Claim 14 is finally rejected under 35 U.S.C. §103(a) over Degani et al. in view of McCormick, Homma and published U.S. Patent Application No. 2003/0034489 to Bhattacharya et al.

Essentially, the thrust of the response in the final rejection to the applicants' prior argument, is that reciting "'plated' is essentially a product-by-process limitation that does not structurally distinguish the claimed invention over the prior art." However, when a metal structure is plated, the plating covers whatever portion of that structure that is exposed to the plating process. Thus, very clearly from Homma Figure 9E the copper diffusion preventing film 84, which extends beyond the exposed surface of the copper pad 81 and over the passivation film 82. Plating the Homma copper pad 81 would have resulted in a decidedly different STRUCTURE, i.e., diffusion preventing film 84 only at the exposed surface of the copper pad 81. Accordingly, reciting "plated" goes to the resulting structure, not just the process by which that structure is made. Certainly, the structure of Homma Figure 9E could not be plated within the "broadest reasonable interpretation consistent with the specification." >*In re Hyatt*, 211 F.3d 1367, 1372, 54 USPQ2d 1664, 1667 (Fed. Cir. 2000)" (emphasis added). See, MPEP §2111. So, even if one were to accept that "'plated' is essentially a product-by-process limitation;" it most assuredly does "structurally distinguish the claimed invention over" Homma. Further, since the hard test barrier layer is plated to the conducting layer pad, the hard test barrier layer encloses the conducting layer pad. See, e.g., Figures 3 E – G of the present application. Therefore, Homma neither teaches or suggests the present invention as recited in claim 1, as finally rejected or as amended by the proposed amendment. Entry

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of the amendment, reconsideration and withdrawal of the final rejection of claim 1 is respectfully requested.

Furthermore, since dependent claims include all of the differences with the prior art as the claims from which they depend, claims 2 – 5, and 7, which depend from claim 1, are also believed to be patentable over Homma. Reconsideration and withdrawal of the final rejection of claims 2 – 5, and 7 is respectfully requested.

Regarding the rejection of claims 1, 5, 7, 21 and 25 over the combination of Tseng et al. and McKormick, it is asserted that Tseng et al. shows layers 26/28 (asserted to be a hard barrier layer) plated to a layer 20 of conducting material. So, Tseng et al. shows surface layers plated to one another and patterned to form a pad. Claim 1 is amended to recite a “hard test barrier layer on, and enclosing, said conducting layer pad” with claim 21 amended to include a similar recitation. The amendment to claims 1 and 21 is supported by the specification as filed. Specifically, “in step 124 the seed layer is patterned to define seed pads. In step 126 the seed pads are plated with a hard test barrier metal, e.g., layer 114.” Page 4, lines 15 – 17. Further, “the exposed portions of the seed layer 146 are removed, e.g., etched to leave copper pads 152 (corresponding to pad layer 114 in Figure 1) on the barrier/adhesion layer 144 as shown in Figure 3C.” Plating the seed pads 152 in step 126 begins by removing the mask pattern to expose the seed pads 152 as shown in Figure 3D. Then, a hard test barrier layer 154 is formed on the seed pads 152 in Figure 3E,” Page 5, lines 6 – 11. While Tseng et al. shows surface layers plated to one another, Tseng et al. fails to show a hard barrier layer plated to/enclosing a conducting layer pad. McKormick is cited to show a bonding pad with a gold passivating layer over a nickel layer. Be that as it may, no reference of record shows a plated pad and particularly, the pad being enclosed by a hard barrier layer. Therefore, the present invention, as recited in claims 1 and 21, is neither taught nor suggested by Tseng et al., McKormick or any reference of record. Entry of the amendment, reconsideration and withdrawal of the final rejection of claims 1 and 21 is respectfully requested.

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Since dependent claims include all of the differences with the prior art as the claims from which they depend, claims 5, 7, and 22 – 25, which depend from claims 1 and 21, respectively, are also believed to be patentable over all references of record. Reconsideration and withdrawal of the final rejection of claims 5, 7, and 22 – 25 is respectfully requested.

Regarding the rejection of claims 8 – 13 over the combination of Degani et al. and McKormick, and of claim 14 over the combination of Degani et al. and McKormick in further view of Homma and Bhattacharya et al., it is asserted that Degani et al. teaches “an adhesion/barrier layer 22/21 on said terminal metal layer; a seed layer 23 (Cu) (col. 3, line 53) on said adhesion/barrier layer; and a plate passivating layer 14 (Au) (col. 3, line 63).” Clearly, Degani et al. teaches forming layers 21, 22, 23 and 24 on the IC chip surface, and patterning 31 all four layers at once. Claim 8 is amended to recite “a hard test barrier layer plated on, and enclosing, said seed pad,” which is supported in the specification as indicated hereinabove. The patterned Degani et al. layers 21, 22, 23 and 24 are not a hard barrier layer plated to a seed pad as amended claim 8 recites and, particularly, a nickel layer plated to a copper pad and extending along the sides of the copper pad as amended claim 12 recites. Neither is this shown or suggested by Degani et al., McKormick, Homma, Bhattacharya et al. or any reference of record. Therefore, the present invention, as recited in claims 8 and 12, is neither taught nor suggested by any reference of record. Entry of the amendment, reconsideration and withdrawal of the final rejection of claims 8 and 12 is respectfully requested.

Since dependent claims include all of the differences with the prior art as the claims from which they depend, claims 9 – 11, 13 and 14, which depend from claims 8 and 12 are also believed to be patentable over all references of record. Reconsideration and withdrawal of the final rejection of claims 9 – 11, 13 and 14 is respectfully requested.

The applicants thank the Examiner for efforts, both past and present, in examining the application. Believing the application to be in condition for allowance, both for the amendments to the claims and for the reasons set forth above, the applicants respectfully

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request that the Examiner enter the amendment, reconsider and withdraw the final rejection of claims 1 – 5, 7 – 14, and 21 – 25 under 35 U.S.C. §§102(e), 103(a), and 112 and allow the application to issue.

The applicants note that MPEP §706 “Rejection of Claims,” subsection III, “PATENTABLE SUBJECT MATTER DISCLOSED BUT NOT CLAIMED” provides in pertinent part that

If the examiner is satisfied after the search has been completed that patentable subject matter has been disclosed and the record indicates that the applicant intends to claim such subject matter, he or she may note in the Office action that certain aspects or features of the patentable invention have not been claimed and that if properly claimed such claims may be given favorable consideration.

(emphasis added.) The applicants believe that the matter presented in the written description of the present application is quite different than, and not suggested by, any reference of record. Accordingly, should the Examiner believe anything further may be required, the Examiner is requested to contact the undersigned attorney at the local telephone number listed below for a telephonic or personal interview to discuss any other changes.

Please charge any deficiencies in fees and credit any overpayment of fees to IBM Corporation Deposit Account No. 09-0458 and advise us accordingly.

April 17, 2006
(Date)

Respectfully Submitted,



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